



Snohomish County
Public Works

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Maximum Extent Feasible Documentation

Project: 116th St SE/56th Ave SE

Project Limits: Intersection

UPI 10-0021-1: Funding code: RC1639

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Snohomish County Engineer

10/3/12
Date

Project Description

116th St SE/56th Ave SE Intersection project will improve the sight distance at the intersection.

The existing curb ramps will be removed and new ADA-compliant curb ramps will be installed at the intersection.

Existing Conditions

The existing road grades at the intersection are as follows:

116th St SE (West Leg) = (-) 9.6% (Arterial)

116th St SE (East Leg) = (-) 13.1%

56th Ave SE (South Leg) = (+) 4.18%

56th Ave SE (North Leg) = (-) 5.36% (Arterial)

The south leg of the intersection was temporarily closed to traffic due to insufficient sight distance. A new development is being constructed at the northeast corner of the intersection. There are two retaining walls: one at the northeast corner and one at the southwest corner.

None of the existing ramps at the intersection met the current ADA standards (2005 PROWAG).

Proposed Improvements

To improve the sight distance and provide better traffic management and traffic control a mini roundabout was proposed at the intersection. The mini roundabout and the circulatory roadway were benched to provide a relatively flat slope at the intersection to provide sight distance and pedestrian access. The layout of the splitter islands along all legs of the intersection will better channel traffic through the intersection. The following are the proposed road grades:

116th St SE (West Leg) = (-) 12.65%

116th St SE (East Leg) = (-) 16.28%

56th Ave SE (South Leg) = (+) 4.18%

56th Ave SE (North Leg) = (-) 7.84%

The proposed road profile is steeper due to:

1. Benching for the mini roundabout
2. Match the project at the next intersections on 116th (east and west), without re-grading the road into the next intersections which is outside the project scope.

ADA Compliance requirements

Compliance with ADA will control the design of six components of this project. The ADA design requirements are:

Pedestrian Accessible Route:	Width =4' min.
Sidewalks	
Sidewalk grades	Not to exceed attached road grade
cross-grades	2.0% max.
Ramps	
Ramp grades	8.3% max.
cross-grades	2.0% max.
Landings	2.0% max., all directions
Counter slopes	5% max

Justification for Maximum Extent Feasible

Pedestrian crossing on the west leg of 116th St SE has been eliminated due to minimal sight distance and because of an existing retaining wall blocking the sight distance. A warning sign will be posted with a "Use Crosswalk" sign to direct pedestrians to the adjacent crosswalk.

The cross slope of 5% could not be met on the crosswalks due to the following reasons:

Even though the intersection was benched to improve the sight distance at the intersection, the benching could not be extended to the pedestrian crosswalk due to the project limit scope which would require extending the project limits into the next intersection (re-grading into the adjacent intersection) at the east and west project limits on 116th St SE. Due to the existing steep grades of the road profile, retaining walls at the northeast corner and northwest corner, and the limits of the projects scope, the standards for the cross walk grades could not be achieved. The cross walk follows the road profile and hence the cross walk slope does not meet the ADA grade of 5%.

However the curb ramps and the pedestrian facilities, the crosswalk cross slopes and landing have been improved over the existing conditions, as shown in the attached spreadsheet. The cross walk grades were minimized to the maximum extent feasible by positioning these as close to the circulating roadway (roundabout) as possible.

The roundabout layout at the intersection improved the sight distance, pedestrian facility and better traffic control at the intersection from the existing conditions.

116th St SE/56th Ave SE Intersection Improvement

Documentation of Maximum Extent Feasible for sidewalk curb ramps

As-Designed: Sheela George
As-Built check: Celia Eizik

Date: 8-22-2012
Date: 9-11-12

			Perpendicular Ramp				(g) Gutter Slope	(m) Counter Slope	Landing		Parallel Ramp - Left or Single		Parallel Ramp - Right		
(a) Width/ Cross Slope	(b) Length/ Running Slope	Flare Slopes 10% Max		(c) Width / Cross Slope	(d) Length / Running Slope	(e) Length / Running Slope			(f) Width / Cross Slope	(h) Length / Running Slope	(i) Width / Cross Slope				
Ramp #	Location		4' Min / 2%	15' Max / 8.3%	(j) Left	(k) Right	2% Max	5% max	4' Min / 2%	4' Min / 2%	15' max/ 8.3%	4' min/2%	15' max/ 8.3%	4' min/2%	Justification for Maximum Extent Feasible
Northwest corner															
Ramp 1	56th	Exist	Could not find details from survey. One Existing parallel ramp				8%								Gutter slope follows the road. It is not feasible to provide crossing without re-grading road into the adjacent intersection.
		Prop	4' / 1.5%	3.5' / 1.2%			6.2%	2.80%	4' / 1.5%	5' / 0.2%	15' / 9.7%	5' / 2%	8' / 1.5%	5' / 1.9%	
Ramp 2	116th	Exist	Could not find details from survey. One Existing parallel ramp												Cross walk has been eliminated due to minimal sight distance because of a retaining wall at the corner. "No Ped Crossing" sign installed to direct pedestrian to crosswalk.
		Prop	Eliminated												
Northeast corner															
Ramp 1	56th	Exist	9.0%	1.1%	10.1%	5.6%	9.7%		11.3%	0.3%					Gutter slope follows the road. It is not feasible to provide crossing without re-grading road into the adjacent intersection.
		Prop	4' / 1.8%	6' / 2.3%			4.0%	2.4%	4' / 1.6%	5' / 1.0%	7' / 2.5%	5' / 2%	12' / 7.5%	5' / 2.3%	
Ramp 2	116th	Exist	11%	0.4%	9.8%	9.8%	9.9%		13.2%	4' / 2.5%					Gutter slope follows the road. It is not feasible to provide crossing without re-grading road into the adjacent intersection.
		Prop	4' / 1.8%	3' / 0.9%			9.9%	2.8%	4' / 1.0%	5' / 1.9%	15' / 11.5% (*)	5' / 2%	5' / 11.2% (**)		
Southwest corner															
Ramp 1	56th	Exist	14.7%	8.1%	9.8%	21.6%	13.1%								Gutter slope follows the road. It is not feasible to provide crossing without re-grading road into the adjacent intersection.
		Prop	4' / 1.8%	4.5' / 7%			3.2%	1.7%	4' / 1.0%	5'/0.8%	7'/1.0%	5'/1.8%	15'/9.4%(*)	5'/1.9%	
Ramp 2	116th	Exist	No second ramp												Cross walk has been eliminated due to minimal sight distance because of a retaining wall at the corner. "No Ped Crossing" sign installed to direct pedestrian to crosswalk.
		Prop	Eliminated												
Southeast corner															
Ramp 1	56th	Exist	1.2%	6.7%	6.2%	7.2%	0.3%		1.5%	1.1%	.				Gutter slope follows the road. It is not feasible to provide crossing without re-grading road into the adjacent intersection.
		Prop	4' / -1.5%	3.7' / 3.2%			3.0%	3.0%	4' / 1.8%	5' / 1.9%	12' / 4.9%	5' / 1.8%	9' / 1.3%	5' / 2%	
Ramp 2	116th	Exist	5.7%	5.5%	0.5	11.4%	5.9%		8.1	4' / 0.5%					Gutter slope follows the road. It is not feasible to provide crossing without re-grading road into the adjacent intersection.
		Prop	4' / -1.8%	4.3' / 3.3%			9.0%	2.4%	4' / 2%	5' / 1.6%	5' / 2.9%	5' / 2%	10.6' / 6.8%	5' / 1.8%	

XX Does not meet Standard

(*) Ramp length held to 15-feet to prevent chasing grade (PROWAG R303.2.2.1

(**) Road profile is at 16.28% down hill. Using 15' rule to prevent chase grade increased the running slope. It is not feasible to meet the standard without grading road into the adjacent intersection.

116th St SE/56th Ave SE Intersection Improvement
Crossing/Crosswalk Geometrics

Crossing/ Crosswalk Label	Ramp to Ramp	Stop Controlled	Maximum Running Slope 5%		Maximum Cross Slope 2% (5% non-stop controlled)		Remarks
			Existing	Proposed	Existing	Proposed	
56th Ave SE - North		No	3.1%	1.0%	9.6%	4%- 6.2%	Gutter slope follows the road. It is not feasible to provide crossing without re-grading road into the adjacent intersection.
116th St SE - East Leg		No	2.0%	1.0%	9.8%	(9%-9.9%)	Gutter slope follows the road. It is not feasible to provide crossing without re-grading road into the adjacent intersection.
56th Ave SE - South Leg		No	4.6%	1.0%	5.4%	4.4% (3%)	
116th St SE - West Leg			1.1%	-	6.2%	-	Cross walk has been eliminated due to sight distance - retaining wall at the corner and "No Ped Crossing" sign installed

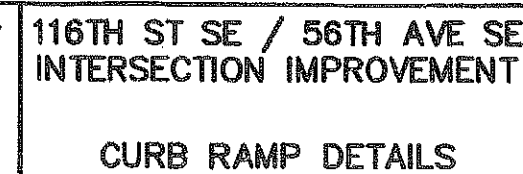
XX Does not meet Standard

REFERENCE
SHEET NO.
CR1
SHEET
12
OF
18
SHEETS

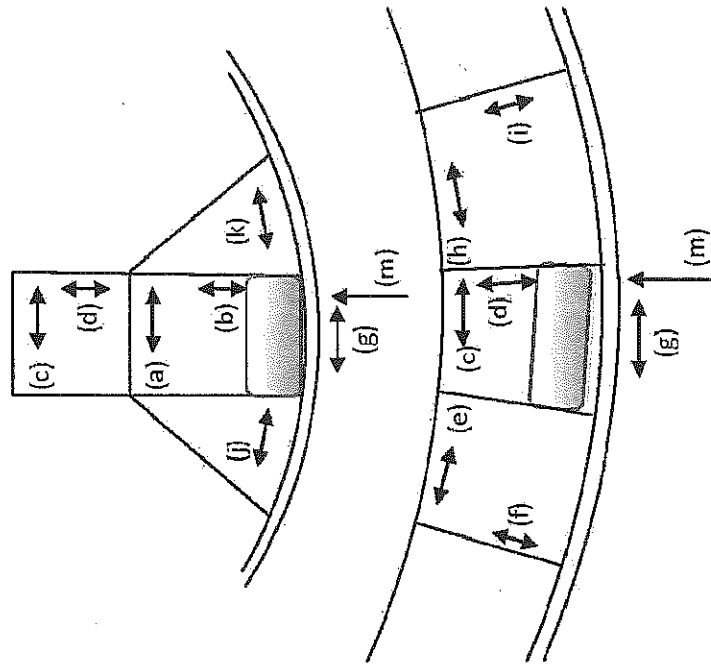
PW Projct Date Management PROJ

REFERENCE
SHEET NO.
CR2

SHEET
13
OF
18
SHEET



Parallel Curb Ramp



Perpendicular Curb Ramp

